

ments 61, one such segment forming a part of or extending from a respective one of the portions 13 and 15. As shown better in FIGS. 3-5, member 51 includes a hollow central portion 63 with longitudinal sides 65 which function to interconnect the opposed end sections 55. Significantly, the illustrated two sides 65 in turn define a pair of opposed openings 67 and 69 therebetween. As seen in FIGS. 3-5, each segment 61 is designed for being positioned within a respective opening (the segment 61 from base portion 13 extending within opening 67 and the segment 61 from second portion 15 extending within the opposite opening 69) and thereafter engaging an internal surface of a respective one of the longitudinal sides 65. Such segments include curvilinear surfaces which correspond to the internal curvature of the respective sides so as to lie substantially flush thereagainst. Such flush engagement enables the cylindrical member's sides 65 to slidably move over the segment surfaces when desired. Of significance, these sides of member 51, and thus the member itself, are able to move independently of the respective portions 13 and 15 for at least part of the rotational (pivotal) movement (represented by the letter "R" in FIGS. 3 and 4) of these members. This is possible because openings 67 and 69 are larger in width than the corresponding segment 61 extending therein.

In FIG. 3, cylindrical member 51 is shown in position relative to second portion 15 when the second portion is in its fully open position relative to base portion 13. The curved external surface of tab segment 61 of the base 13 is shown as engaging the respective curvilinear internal surface of side 65 (to the top), while other segment 61 engages the corresponding internal surface of opposed (bottom) side 65. Portion 15 is now ready for pivotal movement (about the axis occupied by pins 39 and 41) relative to base 13. Notably, the curved surfaces of the two tab segments are of sufficient size so as to maintain engagement with the respective sides at all times during such pivotal motion as well as during the rotational movement of member 51.

In accordance with the unique teachings of the present invention, flexible cable 29 passes through the cylindrical member 51 from one of the portions (13, 15) to the other, as seen clearly in FIGS. 3-5. Cable 29, preferably a relatively flat member comprised of a dielectric material (for example, polyimide) having a plurality of spaced conductors (for example, copper lines) therein as is common in many of today's flat flexible cables (which cabling is also occasionally referred to as flexible circuitry or the like), enters one of the openings (67) and exits the other (69) and is electrically coupled at the terminal ends thereof (not shown) to a respective electronic component located within one of these portions. It is thus understood from the drawings that these ends form extensions of the cabling which has been cut in the drawings (FIGS. 3-5) for illustration purposes. Cable 29 "snakes" its way through the cylindrical member and, significantly, is thus hidden from view when the invention is fully assembled (FIG. 1). More significantly, the unique arrangement described herein precludes the previous necessity for excessive bending or twisting of cable 29 in order for the cable to properly pass from one portion to the other while still assuring full protection for the cable (for example, from mishandling or exposure during assembly or operation of the invention). As shown herein, cable 29 requires a minimum of such bending and/or twisting, and is substantially fully covered by the invention's other structural

parts in the finally assembled product. Perhaps more significantly, and quite surprisingly, the cable 29 also functions to assist in rotation of member 51 and is able to do so without harm to the cable (or to member 51, for that matter). As seen in FIG. 4, with portion 15 pivoted to a partly closed position, cable 29 engages an internal edge of the top side 65 of member 51, which engagement continues during final closure of portion 15 and thus forces member 51 to rotate about the central axis occupied by pins 39 and 41. It is again noted that tab segments 61 remain in physical, sliding contact with the respective internal surfaces of sides 65. At final closure, shown in FIG. 5, member 51 has rotated fully until an edge opposite that engaged by cable 29 has engaged (and abutted against) a respective outer surface of the tab segment of portion 13. It can be clearly seen in FIG. 5 that the cable still has adequate spacing within opening 69 such that damage to the cable does not occur. Further, it can be seen that the opposite opening 67 affords adequate spacing for the other end of cable 29, such that buckling, twisting or bending thereof will not occur, regardless of the degree of pivotal movement of portion 15. Member 51 is also preferably of plastic, a preferred material being polycarbonate (including those polycarbonates of the electrically conductive variety). In one example of the invention, member 51 possessed an overall length of 38 millimeters (mm.), an outer diameter of 7 mm. and an internal diameter (for its central, hollow portion) of 6 mm. Each opening 67 and 69 possessed a length of 30.2 mm. and a corresponding width of 2.3 mm. In this embodiment, cable 29 possessed a thickness of only about 1.5 mm. and a width of about 30 mm. Despite such relatively thinness for such a component, the described rotation of the cylindrical member 51 without harm to the cable was repeatedly possible.

Thus there has been shown and described an electronic apparatus which provides a new and unique cabling system for electrically interconnecting two portions thereof in a safe and effective manner, while still assuring a pleasingly aesthetic appearance for the final product. The connecting structure as defined herein is of relatively simple construction and can be assembled in minimal time and at relatively less cost than many connections structures of the prior art.

While there have been shown and described what are at present considered the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the scope of the invention as defined by the appended claims. For example, it is readily possible to incorporate some ratchet means or the like as part of the invention's hinge means in order to provide incremental movement of the invention's first and/or second portions, while still assuring the several highly advantageous features cited herein. As also stated above, the teachings of the invention are readily adaptable to electronic apparatus other than portable computers such as those referred to occasionally in the art as "laptop" computers. That is, the teachings herein are readily adaptable to a variety of products which utilize two portions requiring electrical interconnection therebetween using some form of electrical cable.

We claim:

1. An electronic apparatus comprising:
a first portion including at least one electronic component;